Amendments to the Claims

This listing of claims will replace prior versions and listings of claims in the application:

Listing of claims

Claims 1-41 (cancelled)

42. (new) A method for selecting a compound which reduces the activity of a SCN1A sodium ion channel comprising:

(a) contacting a composition comprising a SCN1A sodium ion channel protein with a test compound;

(b) assaying the activity of the sodium ion channel in the presence of said test compound;

(c) comparing the activity of the sodium ion channel in the absence of said test compound; and

(d) selecting a compound which reduces the activity of the sodium ion channel as compared to the activity of the sodium ion channel in the absence of the test compound,

wherein said SCN1A protein is selected from the group consisting of:

(i) SEQ ID NO:3;

(ii) SEQ ID NO:4; and

(iii) a SCN1A protein encoded by a SCN1A nucleic acid sequence having at least 95% identity overall to the nucleic acid sequences as set forth in SEQ ID NO:1 or 2.

43. (new) The method of claim 42, wherein said method is used for selecting a compound capable of reducing voltage-gated ion channel activity of a human SCN1A protein associated with idiopathic generalized epilepsy (IGE).

44. (new) The method of claim 42, wherein said method is used for selecting a compound capable of reducing voltage-gated ion channel activity of a human SCN1A protein associated with generalized epilepsy with febrile seizures.

45. (new) The method of claim 42, wherein said test compound is library of test compounds.

46. (new) The method of claim 42, wherein a SCN1A nucleic acid encoding said SCN1A protein is comprised in an expression vector.

47. (new) The method of claim 46, wherein said expression vector is comprised in a cell.

48. (new) The method of claim 42, wherein said assaying is performed in a cell free system.

49. (new) The method of claim 42, wherein said assaying is performed with a whole cell.

50. (New): The method of claim 42, wherein said ion channel activity is:

(i) voltage dependence activation;

(ii) voltage dependence of steady state level of inactivation;

(iii) time course of inactivation;

(iv) the number or fraction of channels available for opening;

(v) change in current;

(vi) flux of ions through the channel;

(vii) phosphorylation of channel;

(viii) binding of molecules to the channel; or

(ix) induction of a second cellular messenger.

51. (new) The method of claim 51, wherein said flux of ions through the channel is assessed by:

(i) fluorescence resonance energy transfer (FRET)-based voltage sensor assay;

(ii) dibasic dyes;

(iii) ^{14}C-guanidine;

(iv) two electrode voltage clamp; or

(v) patch-clamp.

52. (new) The method of claim 51, wherein said binding of molecules through the channel is assessed by surface plasmon resonance.

53. (new) The method of claim 42, wherein said method is used for selecting a compound which reduces the hyperexcitability state of a SCN1A ion channel.

54. (new) The method of claim 42, wherein SEQ ID NO. 3 is obtained from a SCN1A nucleic acid sequence encoding SEQ ID NO. 3.

55. (new) The method of claim 42, wherein SEQ ID NO. 4 is obtained from a SCN1A nucleic acid sequence encoding SEQ ID NO. 4.

56. (new) The method of claim 42, wherein a SCN1A nucleic acid sequence comprises a sequence selected from the group consisting of SEQ ID NOs: 189-192.

57. (new) The method of claim 42, wherein a SCN1A protein comprises a D188V mutation.